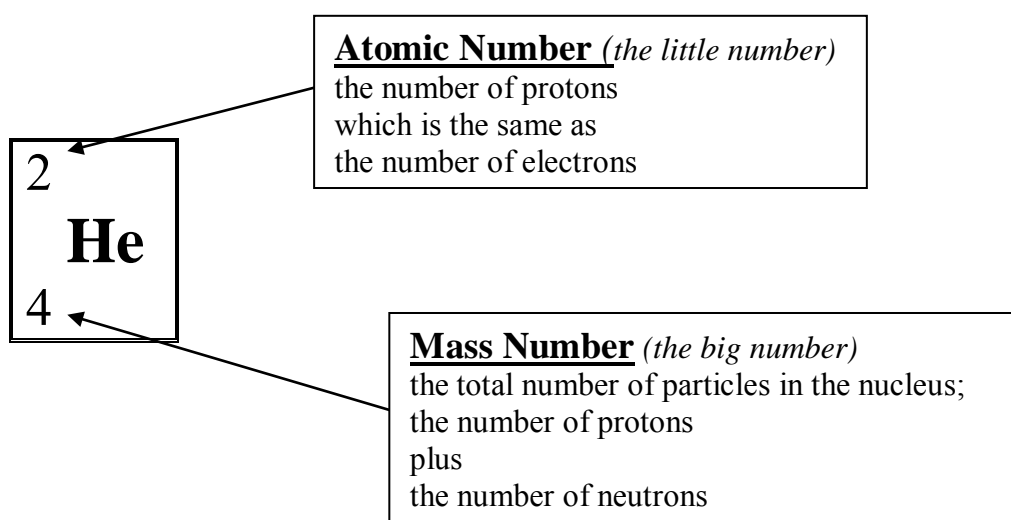


Sub-atomic particles

Atoms are the basic building blocks of matter that make up everyday objects. A desk, the air, even you are made up of atoms! Atoms are made up sub-atomic particles which are called electrons, protons and neutrons.

The centre of an atom is known as the nucleus. The nucleus is where protons and neutrons are found. Electrons are extremely light, they continuously orbit the nucleus of an atom in electron shells. Only two electrons fit on the first shell, eight electrons fit on the second shell and eighteen electrons fit on the third shell.

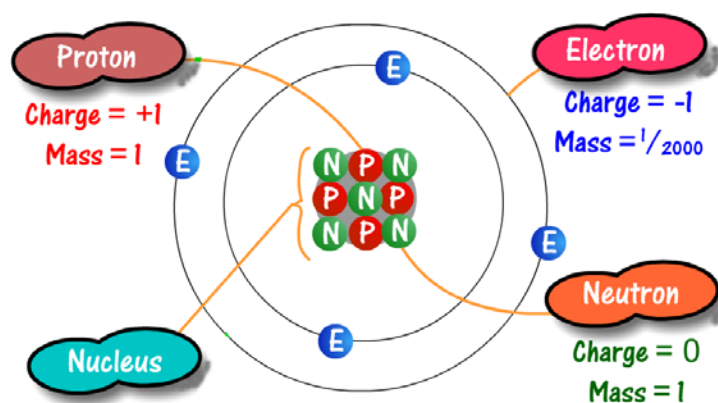
The numbers of sub-atomic particles for each element are shown on the Periodic table.



⇒ Use the information above to answer the following questions

1. How many electrons, protons and neutrons does an atom of helium have? _____

2. Draw a neat, labelled sketch of an atom of helium



3. Look at the image above of an atom, state the number of protons, electrons and neutrons

4. Use the numbers of protons and neutrons to state the Atomic number and Mass number for this element

5. Look at your Periodic table and find out the name and chemical symbol of the element shown above

The table below summarises the relative mass and charge of sub-atomic particles




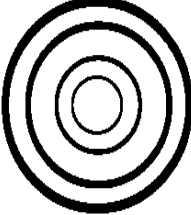


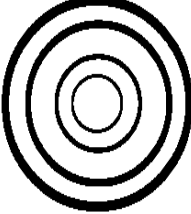



















sub-atomic particle	relative mass	charge
electron	1/1840	negative
proton	1	positive
neutron	1	neutral

6. State the names of the three types of sub-atomic particles


7 i) Describe the location, charge and relative mass of each sub-atomic particle

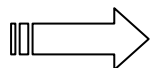
ii) Describe the number of electrons, protons and neutrons in a potassium atom, also describe the relative mass and charge of the sub-atomic particles in a potassium atom.

Circles of atoms

1				
2				
13				
14				
15				
16				
17				
18				

Transition elements





Use your electron shell diagrams to answer the following questions

1. How many valence (outer shell) electrons do the Alkali metals have? _____
2. How many valence electrons do the Alkaline-earth metals have? _____
3. How many valence electrons do the Halogens have? _____
4. How many valence electrons do the Noble gases have? _____
5. How many electron shells do the period 1 elements have? _____
6. How many electron shells do the period 2 elements have? _____
7. How many electron shells do the period 3 elements have? _____
8. How many electron shells do the period 4 elements have? _____

Elements in the same group have the same number of valance (outer shell) electrons

The period numbers indicate the number of electrons shells of the atoms

9. Complete the table below

Element name	Chemical symbol	Group number	Period number	number of protons	number of electrons	number of neutrons
hydrogen	H	1 (although H does not fit the properties of group I as H only has 1 electron)	1	1	1	0
carbon						
nitrogen						
oxygen						
fluorine						
neon						
silicon						
sulphur						
calcium						
lead						
iron						
copper						
gold						